

North Dakota's Information Technology Department



A Study on the Replacement of Desktop Phones by Cellular Devices

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Purpose

Forrester Research estimates 25% of business are dropping their desk phones and opting for cell phones (12/30/2008, USA Today). Before investing heavily in VOIP infrastructure, it is prudent that state government look into the concept of cellular phone alternatives. Part of ITD's mission statement is to provide leadership and knowledge to assist our customers to succeed. We want agencies to think about these issues and develop their own strategy on how they intend to handle this growing trend.

Executive Summary

With cellular plan price dropping close to desk phone costs it is easy to see why this is being considered, especially in tougher economic times where everyone is looking for places to cut costs. However, personal phone plans will seldom meet the needs of businesses. When you start adding minutes and other features businesses use, the price quickly climbs. A general estimate of cost for ITD's BlackBerry service is over \$91 per month. This doesn't mean agencies shouldn't look at this possibility. But they need to really assess the needs and services they want before making any decision.

While most of the major research firms are forecasting that businesses will be moving towards cellular service only, most of the examples found in our research were pilot projects. There were not a lot of examples of many large businesses fully committing to the concept. Our own surveys indicated that most state governments are not currently making any significant move towards replacing desktop phones.

One key reason is that the industry is still at bleeding edge when it comes to providing advanced telephony services (such as conference calling) to cellular devices. It will likely take 3-5 more years before the industry settles down. This doesn't mean that ITD shouldn't be able to provide some level of advanced service to agencies. In fact, ITD needs to be prepared to support a growing demand. However ITD will need to be careful not to create a system that the demand can't support.

Based upon our evaluation, the state will still need the telecom infrastructure. That infrastructure still provides the basis for all of the advanced features. In order to truly integrate cellular devices into the business, the telephony infrastructure needs to exist. For example, one of the things we determined was that the best way to handle calls was to reroute the assigned 328- number to the cellular phone. (See distribution options for more details.) The only way to do that is via our telephony infrastructure.

For the most part, agencies can only expect to save money if they are already paying for both devices. If you just want to move from a desk phone to a cell phone, there will probably be a cost increase or you lose many features such as call transfer and conference calling. However, this may make sense to do for certain employees. In fact for some employees it could provide great value. But agencies should carefully weigh the business needs of the individual, evaluate the advantages and obstacles noted in this document, and develop a policy on how they plan to manage and support cellular devices within the agency before making any significant moves towards replacing the desktop phone.

Trends

The study team looked at a number of different resources for its research. The team sent surveys to the National Association of State Chief Information Officers (NASCIO) and to the National Association of State Technology Directors (NASTD). The team also researched the World Wide Web, Gartner and specific telecommunication organizations websites.

The [Nielson Company](#) issued a report in September 2008 that based upon a June 2008 survey, the number of households that had dropped their landline phone for a wireless phone only had risen to 17.1%. They also noted that, on average, this percentage has grown by 3-4 percent per year. This survey focused on households only, not businesses.

The Nielson report noted that most of the people who have dropped their landline were:

- In the lower income bracket (46% with a household income of \$50,000 or less)
- Are younger (64% in the age range of 18-34 years old) and many have never had a landline (for example, younger people who have moved out of their parents home for the first time)
- Are renters

The most common reason for dropping the landline was to save money. Those who cut the landline tended to use more minutes than those who don't. However, even with that accounted for; most average households who cut the cord saved \$33 per month. Most of the articles noted that the tough economic conditions will likely increase the number of people doing this.

With that many people moving to cut the landline, it is logical to ask why business can't do the same. As of this point, we were unable to find any specific surveys on what was occurring in business or government entities. However, a December 2008 article by [Fierce Telecom](#) quoted Forrester Research as saying about 25% of businesses are starting to phase out landline phones.

A Gartner report dated December 1, 2008, predicts that the number of business mobile phones will overtake the number of fixed access, teleworkers and desktop phones by 2011.¹ And, while businesses are aware of the mobile phone growth, most have not defined the expense of supporting them. One of the recommendations in the report is to prepare for the shift towards mobile devices by writing and extending mobile phone policies.

Several of the articles researched noted the same examples of businesses moving to wireless.

- In 2005, Ford Motor moved 8,000 engineers to cell only. We were unable to find any follow-up information on the success of this move or any follow-on activities
- The City Administrator's office of Washington DC is piloting the program with 30 employees. The program started in October of 2008.
- KLA-Tencor, a \$2.5 billion tech company is doing a pilot with 42 employees. The phones will link into the companies VOIP system.
- Several colleges are also going wireless only, especially in dorms. Most college students bring a cell phone with them and didn't use the landlines.

As you can see, we didn't find any examples of significant adoption of cutting the landlines in the business environment. Most medium and large businesses rely on many of the features a central landline system provides. For example, multiple lines answered by a single or small group of people, simplified call transfers, a centralized voicemail system, and for the state of North Dakota, a standard block of prefixes (328-). Several examples of business (especially small businesses) that moved to a cell phone only structure, also added a "soft phone" on their computers to provide backup service and reduce some of the minutes usage.

One of the key factors in the slower adoption of removing the landline by businesses is that the industry is really in the early stages of offering what is being termed as Fixed Mobile Convergence or FMC. This allows any cellular device to tie into the centralized phone infrastructure. Many businesses have commoditized the landline service so much that the costs are relatively low. The costs and risks of adopting "bleeding edge" technology are often difficult to justify. However, as businesses begin to roll out new IP devices, many are looking closer at this technology to see if they can find some savings.

The survey responses showed that most respondents were aware of the growing trend but had not made any significant move towards replacing desk phones with cell phones. South Dakota did perform some research for an agency request. Their conclusion was that based upon their cellular plan, in order for cell phones to be cheaper than landlines, people would have to use their phones for less than 60 minutes per month.

¹ Gartner Research #G00163126

offer of employment could be that the employee was expected to own a X type of cellular device (smart phone if a data plan was required for the job or a cell phone if not) and that X dollars were added into the salary offer to support that. Both Alltel and Verizon offer state employee's a 15% discount for their personal phones. A more out-of-the-box model of support would be to see if the state could reach an agreement with the providers to pay a certain amount to the vendors for an increased discount to state employees.

Advantages

- The first advantage is cost. The agency would not have to purchase one of the new IP phones ITD is rolling out (one-time fee) and could save on the monthly phone charges.
- One of the key advantages is the ability to carry only one device. They would no longer need to carry a work phone and a personal phone.
- If ITD redirected the 328- number to the phone, when the employee was on leave, they could make their work number "busy" and so all work calls would go straight to voice mail without impacting personal calls directly to their personal number. It supports the idea of being able to turn work "off".
- If ITD redirected the 328- number to the phone, the state could take advantages of some of the newer Unified Communications being rolled out.
- If agency built the supplement into the salary offer, any incremental salary increases would include this amount.
- If the supplement was in the form of the increased discount, it could be possible that employees could avoid paying increased taxes because the state was paying a vendor for the service. (See Obstacles below)
- If the phone was lost or damaged, it would be the employee's responsibility to replace.

Obstacles

- Almost all forms of supplement will have a tax impact on the employee. Obviously, the tax liability will vary depending on household income and many other factors, but a \$20 per month increase would likely result in a \$20 to \$40 increase in annual taxes owed.²
- Redirecting the 328- number would require the state to maintain its infrastructure. In fact, to provide any features other than the redirect, it would require additional infrastructure. So rather than being able to reduce costs

Using State Owned Phones

This concept is that the state purchases and issues the cellular device. These could be basic cell phones for some employees and smart phones for others that require that level of capability.

The phone number issue is still something for consideration. You would have less concern assigning a 328- number to the phone should the employee leave because the phone would still belong to the state and the agency could reassign it to another employee. The state would have to develop a process when deactivating a device to ensure the state retained the 328- number. However, that introduces the risk of losing the number and you still have the loss of FMC features. Redirecting would still be the optimal choice.

Open records would be much clearer. As a state owned device, it would fall under the same rules as any other state owned device such as a PC.

Agencies would still need to develop policies regarding usage and how to determine who receives a phone only and who receives a smart phone.

Advantages

- State maintains control of the devices

² Determined by using the IRS Publication #15 and determining the difference a \$20 monthly increase to a paid monthly employee would make over a range of salaries and multiplying that by 12 months.

- Allows standardization to a handful of models, simplifying support and having a small number of spares on hand for emergency replacement
- Standardization would also allow the agency to have custom apps developed that work on their phones.
- Avoids tax issue as long as they use the cell phones solely for business purposes. (See obstacles below.)

Obstacles

- The employee would have to log all personal calls and the amount would constitute a taxable “benefit”. While there is a lot of talk regarding changing this, our research does not show any current pending federal legislation. Should this requirement change, then this may become a more viable option.
- Or the employee would carry two phones, a business and a personal one.
- The state would want to consider some kind of insurance program would need to be

Issuing Standardized Smart Phones

This concept is to issue a standard smart phone across the board. All employees who are assigned a cellular device would get one of these.

Advantages

- Having a single brand/type of phone simplified support for the devices. Support staff can get a better understanding of the device and can quickly build processes for the most frequent issues users may have.
- One big advantage is that you could build applications designed to work on that particular device. An example would be to extend the ITSM application (an issue management tool) so that when the support center agent enters a ticket, the person assigned could be notified of the ticket, would have access to all of the information, and could update and close the ticket after resolving the issue all by using their mobile device. You could still develop a web-based interface for phones without having standard devices. However, you could simplify certain procedures and features by using known functionality of the device.

Obstacles

- Cost is the biggest obstacle. While the voice plan costs are usually quite reasonable, when you add costs for data the price becomes much less competitive compared to land lines. In addition, device costs are significantly higher as well.
- There will always be exceptions to standardization and support will still need to account for those exceptions.

Soft Phones

Soft phones are applications that let you make phone calls using your computer. While not directly related to replacing the desktop phone with a cellular device, this application is another method of replacing the desktop phone. Our research showed that many of the smaller businesses who were replacing their landlines with cellular devices were also adding a soft phone. Most were using a provider like Vonage for service.

The state already has a soft phone option available.

Advantages

- One advantage of having a soft phone as well as a cellular device is that you can save minutes on your cellular plan. This could be significant when participating in conference calls and webinars, many of which run an hour or longer.
- The soft phone could also provide easier control of the unified communication features. Many of the features could be set up visually on the soft phone instead of having to remember a key

combination to use on the cellular device. For example, the system could be set up to use #7 on the cellular device to activate the “Make Busy” feature sending all calls to the 328- number straight to voicemail. Or you could push a button on the soft phone labeled “Make Busy”.

- Most of the people in the research using a soft phone cited emergency backup as one of the main reasons they added the soft phone. Even if you forget your phone at home, the batteries die, it falls on the ground and a truck runs over it, you will still have access to your phone until the issue is fixed.
- A related reason to have this feature is that often during disaster situations cellular service infrastructure is impacted and the service becomes overloaded. The soft phone provides an alternate method of voice service.

Obstacles

- One of the key obstacles is that this option is not free. Additional costs include about \$125 one-time installation costs and a little over a dollar per month (\$13 per year per client).
- Other activities on your computer can impact the quality of the call. An active virus scan can use a lot of processor time causing delays and dropouts. A lower bandwidth, such as dial-up, can also impact the quality of the service.

Phone Features

Today there is a blur between work and personal time. Each generation brings a different perspective and expectations to this concept. Many people are willing to take care of business during personal time, but they also expect to be able to deal with personal business on work time. These features allow the worker to manage these needs more effectively.

Unified Communications (UC)

One of the challenges the study team faced was defining this term. We found that the definition of Unified Communications is often different for different people and vendors. Microsoft sees it one way, Nortel another. Based upon the definition by the [*International Engineering Consortium*](#), it is in essence the ability to communicate with someone independent of the device of transmission or receipt. This doesn't mean that everything possible that the state deploys must have Unified Communication. North Dakota state government needs to define what unified communication means to North Dakota state government. Some things are already available and an agency could implement some with minimal cost or as part of a larger upgrade.

- Presence is one of the main UC concepts. Who is available and who is in a meeting. ITD currently uses Microsoft Communicator for its employee presence.
- A feature available in the upcoming version of MS Exchange could allow users to call into their e-mail account and have their calendar read to them.
- Nortel has two UC type offerings. The first is called Mobile X. It would allow a cell phone to be set up to simultaneously ring with a desk phone. You could hand off calls from one device to the next. When on the cell phone, you could conference calls, forward calls and perform most functions allowed by the desk phone. The cell phone could use the internal call system (like just dialing 8-XXXX). This would be minimal setup cost and runs approximately \$140 per year licensing fee.
- Nortel's second offering ups the feature set. The MC3100 offers the basic services noted above as well as providing full FMC capabilities such as single number reach, single business voicemail, access to corporate directory, presence and instant messaging, and simplified management. This product would require a server and about \$1500 labor costs to initiate and about a \$175 annual licensing fee.

Texting

The concept of texting on phones is what Instant Messaging (IM) is for computers. While the concept is the same, at this time they are not interchangeable. IM clients often have additional features such as “presence.” Some phones, like the Blackberry will allow you to add an actual IM client. However, that starts you down the road of supporting multiple IM clients. How many clients will the state support? One for computers, one for Blackberries, one for Palms, one for Windows Mobile...?

Another concern discussed is agency expectations regarding IM/Text. Agencies should develop guidelines for the usage of these technologies. What are the expectations when you receive an IM during a meeting? Is it acceptable having a meeting full of people working on their Smartphone instead of participating in the meeting? It may seem like we should be able to just trust peoples judgment, but the temptation to take care of that one piece of business or the desire to help someone can be very hard to resist.

Calendaring/Contacts

The concept here is to synchronize your calendar and contact list between your phone and e-mail system. This is probably the most popular feature and provides the most value of all the features.

As noted above, one UC feature would allow your phone to actually read back your calendar to you. This would be very useful for those who did not have a Smartphone with the full synchronization feature.

E-mail

The next most popular feature allows a Smartphone to connect to the MS Exchange account giving you instant access to your e-mail. This gives you the capability to read and respond to e-mail anytime, anywhere. You also have the ability to link to other e-mail accounts such as Gmail, Hotmail, or your personal ISP provider account.

There is one significant danger to agencies with many of these features, but especially with e-mail. Federal labor laws require that hourly employees be paid for all work they do. If an hourly employee responds to an e-mail on Saturday, they need to record the time and be paid for it. While it is easy to say, "don't do it", again the temptation is very high. This is especially true when the cellular device is the employee's personal phone.

Web Browsing

Those who bring laptops to meetings already know the value that web browsing delivers. The ability to look up information related to the meeting topic can make the difference between having to wait to make a decision or walking out of the meeting with the decision.

Web browsing on the cellular device gives the same capability for those quick lookups. It also could provide the ability to look at maps/addresses when traveling.

As mentioned in the distribution options, an agency could develop applications designed to work on mobile devices. The most likely delivery vehicle for this application is via the web browser.

Camera/Video

Almost all cellular devices have a camera built into them. Many now also can record video. Some possible business uses for this feature are below.

- Save time documenting a discussion that used a white board. Take a picture of the white board to save it before wiping. Many times visual documentation will improve recall.
- Pictures can also improve processes documentation. Add photo of a real piece of equipment to help support your setup documentation.
- While the picture quality of the common cellular device is still fairly low, it can still provide valuable documentation of a slip/fall accident or other workplace situations.

Document Review

A cellular device is certainly not the best vehicle for reviewing that 80-page document. Nor is it the best if you need to make significant edits/comments to a document. However, it does give you the capability and is very good if all you need is a quick review of a small document or a small number of changes in a larger document.

Tethered Internet (Modem)

Most cellular devices that have data capability can be used as a modem for computers. Travelers don't have to pay for Internet in the hotels. On-call employees can still go out to the lake cabin for the weekend. Cellular coverage in the United States continues to improve and this capability gives employee the ability to work from just about anywhere.

GPS

Finally, many cellular devices have Global Positioning Satellite (GPS) capabilities. From the ability to get maps and driving instructions to being an emergency locator beacon for someone injured in a remote area, GPS provides a number of possibilities. Imagine taking “presence” one more step. It could not only indicate that you are in a meeting, but indicate what room you are meeting in.

Advantages and Obstacles

Previously, we identified specific advantages and obstacles related to specific distribution options or features. In this section we will cover the general advantages and obstacles to the concept.

First there is one aspect that is both an advantage and an obstacle. In disaster situations it is common to have a loss of cellular service. Louisiana’s response to our survey specifically mentioned that factor. We also need to keep in mind that our telephony infrastructure is also vulnerable. As we move to IP infrastructure, we become reliant upon the network infrastructure with routers and switches in wiring closets all over the state. That equipment is also reliant on power to the devices. Battery backup can hold the system up for a while, but eventually (usually 15-30 minutes) those units will lose power and connectivity will be lost. Louisiana said that they found text messaging to be one of the most reliable methods of communication during a disaster. So much of this depends on the type of disaster. North Dakota doesn’t tend to get the widespread disaster that a hurricane can cause. However, floods, tornados and other events can cause issues with almost any infrastructure.

Advantages

- If an agency decided to do this prior to their IP Phone rollout, they could save on 1-time IP phone costs.
- The concept is good for folks that already have multiple devices. It allows a person to consolidate to single device and provides a single contact number to reach him/her.
- One of the most common uses of PDA style devices is the synchronization of your calendar. This feature allows you to make commitments immediately based upon your current calendar setting.
- Text Messaging is the modern day pager. Because it uses a standardized code, systems can be automated to send alerts. This isn’t just for technical people. Systems could notify managers and executives if certain business processes exceeded parameters.
- Cellular devices give agencies the ability to have constant contact with employees. The employee can provide quick answers on the spot enabling the business to continue to operate as usual. Or they can begin work immediately on issues not quickly resolved. The cell phone is the lowest common denominator. It is almost always tethered to the person.
- One advantage voice communications has over other electronic media such as e-mail is the ability to have immediate 2-way conversations. This is especially important when discussing a complex situation.
- A lot of time is lost “catching up” when you are away from your desk for a time. A smart phone could help people lose that backlog issue. No more 500 unread emails waiting for your return.

Obstacles

- Based upon our evaluation, the state will still need the telecom infrastructure. The desk phone service charge currently supports the telephony infrastructure. If a significant number of people move away from the desk phone, a new way to pay for that infrastructure will have to be established.
- Generally you need to replace cellular devices more frequently. You are more likely to drop the cell phone in the toilet than the desk phone.
- Agencies need to factor in the miscellaneous costs of cellular devices. Things like Bluetooth headsets, replacement batteries, phone holsters, etc. Each of these things adds to the cost of cell phone usage.
- In just about all of the distribution methods there are tax implications. If it is a state-owned device, then employees have to log all personal calls and the agency has to classify them as a “benefit”. If the state supplements the employee to use their personal device, the IRS considers it to be taxable income. There has

been talk in the industry of getting this IRS rule changed, but based upon our research, there is nothing currently proposed.

- If personal device is used, the state loses several features such as the pooling of minutes. The state also currently has the ability to replace the cellular device every 10 months at GSA rates. Personal plans would rely on the employee's plan. In addition, tech support becomes more difficult due to the large number of devices available to the consumer.
- Obviously not every position is suitable to move to cellular devices. If someone's job requires ACD (Automated Call Distribution) features or need to have the ability to record calls, then they will need to still keep a desk phone.
- Moving to a more cellular based infrastructure could cause an increase in the overall telephony infrastructure. ITD could see an increase in "trunking" costs. A call comes into the central system on a line and the central system uses another line to send it to the cellular provider for routing to the cellular device.
- The concept is still very new to the industry. Most products available are in their 1st or 2nd version so could still be classified as bleeding edge technology. The industry still needs some time to mature these products.

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